Space Weather Forecast

Issued on Tuesday, 14 February 2023 at 00:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Further isolated M-flares (R1/R2 Radio Blackouts) likely, with a Slight chance of isolated X-flares (R3 Radio Blackout). Chance of G1/Minor Storm on Days 1 and 2 (14-15 Feb).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with a two low-level Moderate-class flares.

There are currently 13 sunspot regions on the visible disc, however many of these are either small and magnetically simple or relatively stable and unremarkable. The largest regions on the disc remain in the northwest, although one has shown signs of decay and the other remains stable. The region in the southeast that had previously been the source of significant flare activity has also decayed over the past 24 hours. The most significant region on the disc is now a region that rapidly developed in the northeast, and which has a more complex magnetic structure. This was the region responsible for the two Moderate-class flares during the period. No Earth-directed CMEs have been observed in available imagery during the last 24 hours.

Solar Wind / Geomagnetic Activity: Solar wind speeds started very slightly elevated around 410 km/s but steadily declined to slow levels, around 340 km/s. However, a sharp but modest increase was observed around 13/1930UTC back to 417km/s before reducing slightly. The strength of the magnetic field of the solar wind weak, although a slight increase was noted after 13/1800UTC. The north-south component fluctuated weakly. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles was at background levels with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to be Moderate, with a slight chance of becoming High with any Strong flares.

Solar Wind / Geomagnetic Activity: 10th and 11th CMEs may give further glancing impacts at Earth on Days 1 and 2 (14-15 Feb), although these are most likely to be weak. There are no significant coronal holes in the forecast at present.

Geomagnetic activity is therefore expected to be mainly Quiet, occasionally Unsettled, with a low chance of rising to Active to G1/Minor Storm on Days 1 and 2 (14th and 15th) should any CME effects become more significant.

Energetic Particles / Solar Radiation: The count rate of energetic particles is expected to remain at background levels, but there is a slight chance of exceeding the S1/Minor radiation

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storm level in response to any significant flares that occur.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	30	10	1	1
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	50	50
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	20	15	10	10
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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